Patent Claims

What Is Claimed:

1. An optical component (1), comprising a base unit (3); a substrate (5) supported by the base unit, the substrate having an optically functional surface in at least one substrate region (7); and a coating (9) on the substrate that extends at least in part beyond the substrate (5) and onto the base unit (3).

2. The optical component (1) as in claim 1, wherein the substrate region (7) is located in predefined fashion in a specific relationship to a reference (13) on the base unit (3) which reference (13) is defined by two plane reference surface on the base unit (3).

3. The optical component (1) as in claim 2, wherein orientation of the substrate region (7) deviates from an orientation that is selectable relative to the reference (13) by not more than 0.25 degrees.

4. The optical component (1) as in claim 2, wherein the substrate region (7) is planar and the reference (13) comprises one or several plane surfaces on the base unit (3), where all surfaces comprising the reference (13) are parallel to one another and to the substrate region (7) within an angular tolerance of 0.15 degrees.

5. The optical component (19) as in claims 2 or 4, wherein the reference (13) and the substrate region (7) extend in one plane.

6. The optical component (1) as in one of claims 1 to 4, wherein the substrate (5) comprises a glass substrate with a structured surface.

7. The optical component (1) as in one of the claims 1 to 4, wherein the functional surface in the substrate region (7) has the optical function of a mirror, a color filter, a polarizing beam splitter, a refractive or a diffractive element.

8. An optical switch (31) incorporating the optical component (1) as in one of the claims 1 to 4.

9. A method for fabricating an optical component (1), comprising the steps of:
   a) producing a base unit (3);
   b) producing a substrate (5) with an optically functional surface in a substrate region (7);
   c) assembling the substrate (5) and the base unit (3) into a component; and
   d) coating the component including the optical surface of the substrate (5) in a vacuum coating process so that the coating extends at least in part beyond the substrate (5) and onto the base unit (3).

10. The method as in claim 9, wherein for assembling the substrate (5) with the base unit (3), an assembly device (17) is used that contains a support plate (19) with which the substrate region (7) is brought into contact, said assembly device (17) containing a counterpart (21) for a reference (13) of the base unit, wherein the counterpart is brought into contact with the reference (13), with the support plate (19) and the counterpart (21) remaining in a rigid position relative to each other at least during the step of assembling the substrate (5) and the base unit (3), while the substrate region (7) and the reference (13) on the base unit (3) are positioned in relation to each other in a manner predefined by the assembly device (17).

11. The method as in claim 10, wherein by means of a first adjustment jig (23) provided on the assembly device (17) the substrate (5) is aligned on the support plate (19).

12. The method as in claim 11, wherein by means of a second adjustment jig (25) the reference (13) of the base unit (3) is aligned on the counterpart (21).

13. The method as in one of the claims 10 or 11, wherein as the substrate (5) is produced, a polished glass surface is generated in at least a partial area of the substrate region (7), and for assembling the substrate (5) with the base unit (3) an assembly device (17) is employed which at least in a surface area of the support plate (19) consists of quartz and that the polished glass surface of the substrate region (7) is molded thereon.

14. The method as in one of the claims 10 or 11, wherein upon contact between the substrate region (7) and a surface of the support plate (19), a negative pressure is created in a gas port (27) provided in a surface of the support plate (19) of the assembly device (17), as compared to ambient atmospheric pressure around the assembly device (17), whereby, during assembly with the base unit (3), the substrate (5) is held in position on the support plate (19).

15. The method as in one of the claims 10 to 12, wherein for assembling the substrate (5) with the base unit (3) an adhesive layer (11) is used which comprises a UV-curing cement and which at least in part fills a space between the substrate (5) and a substrate-accepting interface (15) of the base unit (3), firmly compensating for any height variations of that space.

16. The method as in one of the claims 10 to 12, wherein the substrate (5) and the base unit (3) are assembled by means of a UV-curing adhesive cement and that the substrate (5) is irradiated, via the assembly device (17) or by a light source (29) incorporated in the assembly device (17) or through a gas port (27), causing the adhesive cement to cure.